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Fermilab

Beams Division / RFI Department / HLRF Group

BOOSTER HLRF
-750 BLOCKER CONTROL UNIT
TEST PROCEEDURE

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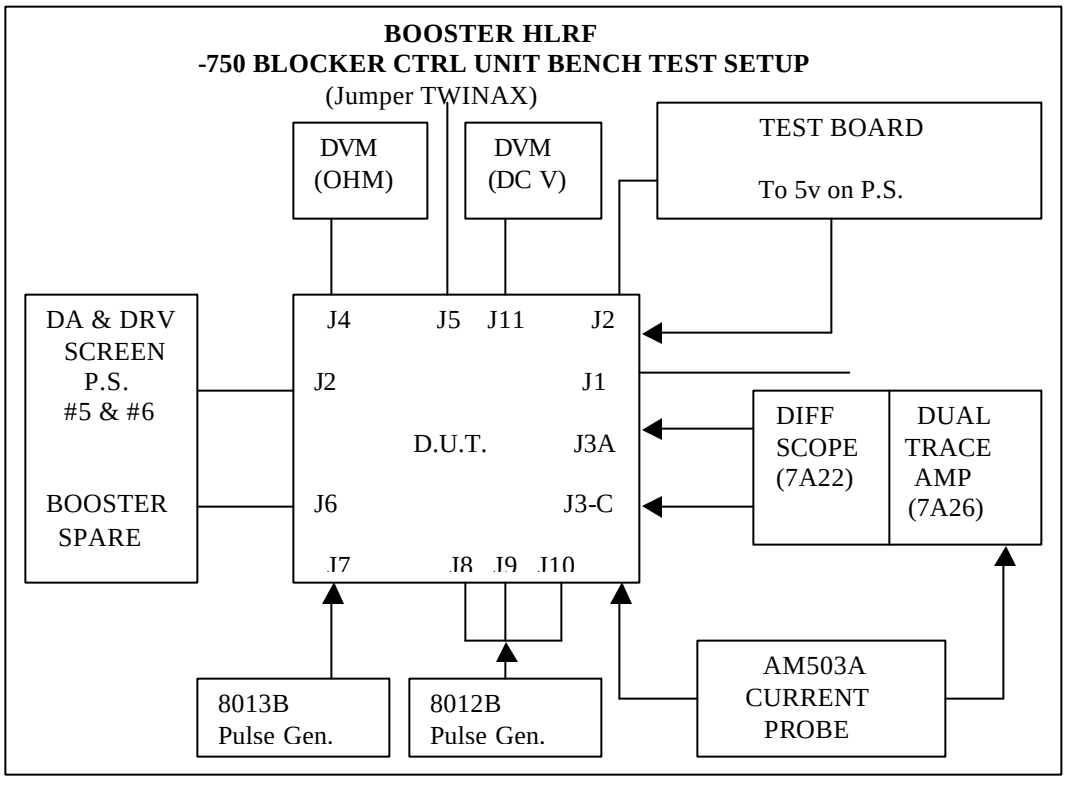
A) EQUIPMENT NEEDED:

1) 1 - (-750 Blocker Control Unit), Test Board w/ Test Cables.
2) 2 - DVM's and 1 -Oscilliscope.
3) 1 - DA & Driver Screen Power Supply. (**Working Spare**)
4) 1 - Tektronics 7834 Storage Scope (**w/7a22 & 7A26 inserts and 2-P6122 Probes**)
5) 1 - Tektronics AM503A Current Probe.
6) 1 - HP 8012B pulse Generator.
7) 1 - HP 8013B pulse Generator.
8) 1 - Pot. Adj. Tool.
9) 1 - 120VAC Line cord.
10) 1- Schematic Dwg# **EE-63387**

B) Modification UPDATES:

1) Cut out SCR1 on 5V P.S.
2) Remove 10K res. from pin1 of U20. (**Old MR Update**)
3) Replace Cable on PCB with new RG_58 JPR**. (Ground on both ends**)

C) CONNECT UP CTRL UNIT TO BE TESTED (refer to Dwg. Below**):**



D) SETTING Control Units OVERCURRENT LEVELS AND The Repeated Spark DIP SW.:

1) DC Cathode O/I = 6.0VDC
2) Fast Screen Current = -.175mv.
3) Fast Cathode Current = -.175mv.
4) Dip Switch Settings Pos. 1 & 3 are CLOSED, all others are open. (*This sets the repeated spark count @ 10 sparks*)

E) SETTING UP THE TRIG II PULSE:

1) Set-up the 8013B Pulse Generator for an amplitude Of 5V @ 2uS Manual Pulse. (*2mS period*)

2) Connect Pulse Generator to J7. (Used in Steps **I** and **J**)

F) FAST CAHTODE CURRENT TEST:

1) Set-up the 8012B P ulse Generator for an amplitude Of 150mv @ 2.5uS no DC offset- Manual Pulse. (*With the min. amp. / vernier set and offset Switch is turned off on generator*)

2) Connect Pulse Generator to J10. - Check for single spark count for each manual pulse of the generator. (*If there is multiple counts - amplitude of generator is probably set to high*).

G) FAST SCREEN CURRENT TEST:

1) Using the same pulse as in step F. (*With the min. amp. / vernier set and offset Switch is turned off on generator*)

2) Connect Pulse Generator to J9. - Check for single spark count for each manual pulse of the generator. (*If there is multiple counts - amplitude of generator is probably too high*).

H) DC CATHODE O/I TEST:

1) Set-up 8012B Pulse Generator for an amplitude of 1V @ 2.5uS,with a +12 VDC offset - manual pulse. (*This is the max. amplitude / vernier and offset on the generator*)

2) Connect Pulse Generator to J8 - check for single spark count for each manual pulse of the generator.

I) REPEATED SPARK TEST:

1) Monitor U1 - Pin 11 (*next to the dip SW. PKG*.). Manually pulse the TRIG II input (J7), until it goes low then high, leave in high state.

2) Using any of the control unit spark inputs (J8, J9, or J10) or Test Spark on FP, increment the counter and on the 10th Spark Count the Repeated Spark Led on the FP & **Test Board** should turn on. Use the DVM to monitor J4, this should show an OPEN Circuit, Pressing reset clears faults and CLOSES Contacts on J4.

J) ANODE INHIBIT TEST:

1) Using any of the control units spark inputs - Use the DVM on the Anode Inhibit line (J11). This line should go to TTL High, and the **test boards** Anode Inhibit LED should turn ON. A Pulse into TRIG II (J7) should reset this line to a LOW.

K) BINARY COUNT & OVERFLOW TESTS:

1) Set either pulse generator to a slow rep rate. Using the pulse generators output on J8, J9, or J10, watch the Binary Counter on the **Test Board**. Verify that the number matches the front panel counter. At count 100 the test boards overflow LED's and the FP overflow LED's should turn ON. They will remain on until the counter is reset.

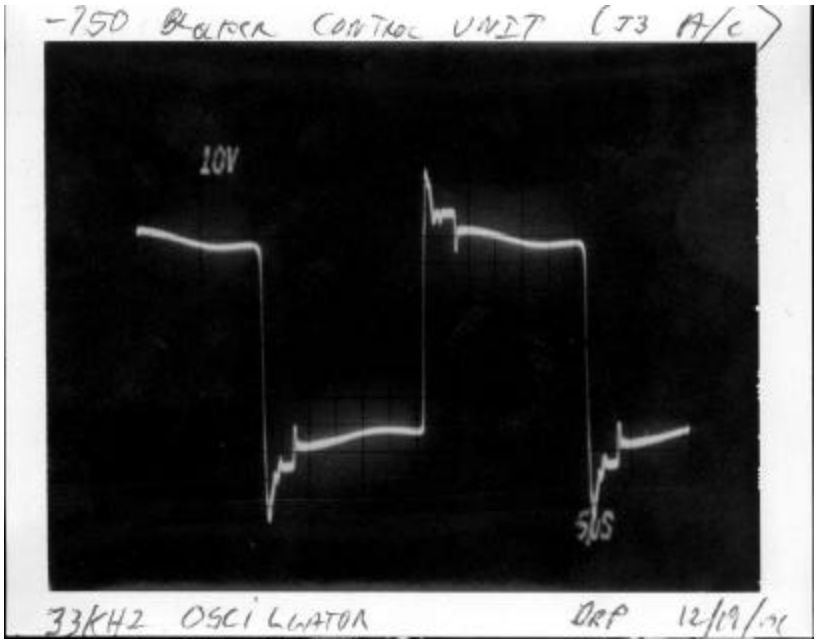
L) MODULATOR ON/OFF & RESET TESTS: using test board

1) Modulator ON/OFF - Enables/Disables the Front Panel Enable LED. (High = On**, J2b**).
   Note: Nothing turns ON w/Mod Switch OFF on **Test Board**.

2) SPARK RESET- Locally or Remotely (**Test Board** J2s**)** - This should reset the counter and turn on the enable light (w/Mod Switch ON).

M) 25Khz Oscillator Checkout:

1) With the Anode input Enabled - Look at differentially with the storage scope using the **(7A22)** differential amplifier module , the 25Khz oscillator signal. Check for balanced 25Khz signals.



2) Switch to the Dual Trace amplifier module **(7A26)** of storage scope and check for balanced emitter currents on the oscillator.

-(50 BLOCKER CONTROL UNIT

12/19/61 DKD

EMITTER CURRENT Q8/Q9 2A/10mV